## REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

**Disposition of Claims**

Claims 1-10 are currently pending in this application. Claims 1, 6, and 9 are independent. The remaining claims depend, directly or indirectly, from claims 1, 6, or 9.

**Specification Amendment**

By way of this reply, the specification is amended. This amendment has been made solely to correct a minor typographical error. No new matter has been added by this amendment, as support for this amendment may be found in paragraph starting at line 13 on page 8 of the specification, as originally filed.

**Claim Amendments**

Independent claims 1, 6, and 9 have been amended to clarify the claimed invention. Specifically, the claims have been amended substantively to include the limitation, "wherein the solid iron product contains neither organic nor oxide binder." Also, claims 1 and 9 have been amended to clarify the claimed feature that relates to a solid iron product or a manufacturing process thereof. Also, claim 6 has been amended to clarify the claimed invention that relates to a process of manufacturing steel. Dependent claims 2-5 and 10 have been amended to conform with the amendments to the base claims. Support for these amendments may found in, for example, paragraph [0007] of the published specification. Further, claim 4, which depended from claim 2, has been amended to depend from claim 3. No new matter has been added by of these amendments.

**Rejection(s) under 35 U.S.C. §102**

Claims 1-3, and 6-8 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,645,719 ("Minnick"). As discussed above, by way of this reply, independent claims 1 and 6 have been amended to clarify the claimed invention. Thus, to the extent that this rejection may still apply to the independent claims, as amended, this rejection is respectfully traversed for the reasons set forth below.

One or more embodiments of the claimed invention relate to a steel manufacturing dust. More specifically, one or more embodiments relate to a solid iron product formed by pressing and reforming dusts, which occur in exhaust gases within a melting furnace during an iron and steel manufacturing process. During an iron and steel manufacturing process, dry dusts are naturally generated in a melting furnace as a result of coagulation of generated vapors. Although it is highly desirable to re-utilize these dusts containing rich iron, it has been difficult to efficiently handle the dusts because they are easily scattered. For example, adding an organic binder allows the dusts to be conveniently solidified, but it also results in introduction of a contaminant that makes technically difficult to recover iron from the solidified dust. One or more embodiments employs a process of pressing and reforming dusts into solid product without using either organic or oxide binders, thereby allowing a recycling process of the iron contained in the dust to be dramatically more efficient.

Accordingly, independent claim 1, as amended, includes, in part, "*a solid iron product formed by pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process... *wherein the solid product contains neither organic nor oxide binder.*" Similarly, independent claim 6, as amended, includes, in part, "subsequently collecting dusts, occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process... *pressing the dusts within the mold to provide a solid iron*

*product*; and reentering the solid iron product into the iron and steel manufacturing process, *wherein the solid iron product contains neither organic nor oxide binder.*" Thus, independent claims 1 and 6, as amended, requires a process of "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process, *without adding an organic or oxide binder,*" or a solid iron product formed by such a process.

In contrast, Minnick relates to a steel-making process where dolomite is charged to a furnace as a basic slag-forming ingredient, the improvement being the intimate mixing of dolomite with iron oxide prior to charging (*see*, for example, col. 3, lines 38-47 of Minnick). However, Minnick fails to show or suggest at least the above feature of "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process, *without adding an organic or oxide binder,*" as required by the claimed invention. In fact, Minnick does not address any issue of efficiency in handling dusts occurring in a steel manufacturing process for recycling iron, as does the claimed invention.

In view of the above, independent claims 1 and 6, as amended, are patentable over Minnick, because Minnick fails to show or suggest all of the limitations recited in the claims. Dependent claims 2-3 and 7-8, directly or indirectly dependent on claims 1 and 6, are also patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 1-4, and 6-8 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0020108 ("Anderson"). As discussed above, by way of this reply, independent claims 1 and 6 have been amended to clarify the claimed invention. Thus, to the extent that this rejection may still apply to the independent claims, as amended, this rejection is respectfully traversed for the reasons set forth below.

Anderson relates to a method of forming combustible briquettes from industrial waste products (*See*, for example, paragraphs [0001] and [0007] of Anderson). The briquettes can then be used as a fuel in a furnace. However, Anderson also fails to show or suggest the above-discussed feature of "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process, *without adding an organic or oxide binder,"* as required by the claimed invention. Anderson is not specifically directed to handling dusts occurring in a steel manufacturing process for recycling iron and, thus, the reference does not teach any specific process of "*pressing and reforming dusts* occurring in exhaust gases *without adding an organic binder*."

In view of the above, amended independent claims 1 and 6 are patentable over Anderson. Dependent claims 2-4 and 7-8, directly or indirectly dependent on claims 1 and 6, are also patentable over Anderson for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 1-3 and 6-8 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,921,427 ("Nayak"). As discussed above, by way of this reply, independent claims 1 and 6 have been amended to clarify the claimed invention. Thus, to the extent that this rejection may still apply to the independent claims, as amended, this rejection is respectfully traversed for the reasons set forth below.

Nayak relates to a process for cold briquetting and pelletization of ferrous or non-ferrous ores or mineral fines (*See*, for example, col. 1, lines 9-12 of Nayak). Prior to charging iron ores into a blast furnace as a raw material for iron and steel, the iron ores are pulverized to form granulates, and then pelletized with a binder (*See,* col. 5, line 45 through col. 6, line 61 of Nayak). However, Nayak also fails to show or suggest the above-discussed feature of "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel

manufacturing process, *without adding an organic or oxide binder,"* as required by the claimed invention. In fact, Nayak discloses only a process of palletizing materials that *employs an oxide binder*, such as sodium silicate, which actually causes inefficient recovery of iron. This is an issue that the claimed invention resolved.

In view of the above, amended independent claims 1 and 6 are patentable over Nayak, because Nayak fails to show or suggest all of the limitations recited in the claims. Dependent claims 2-3 and 7-8, directly or indirectly dependent on claims 1 and 6, are also patentable over Nayak for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 1-3 and 6-8 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,906,671 ("Weinwurm "). As discussed above, by way of this reply, independent claims 1 and 6 have been amended to clarify the claimed invention. Thus, to the extent that this rejection may still apply to the independent claims, as amended, this rejection is respectfully traversed for the reasons set forth below.

Weinwurm discusses the method for separation and recovery of metals and metal oxides from industrial by-products and waste materials (*See*, for example, col. 1, lines 7-10 of Weinwurn). However, Weinwurm also fails to show or suggest the above-discussed feature of "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process, *without adding an organic or oxide binder,"* as required by the claimed invention. Weinwurm teaches difficulty of recovering separation and recovery of metals from a raw material containing contaminants, but never teaches or addresses forming a solid iron product, in particular, by "*pressing and reforming dusts* occurring in exhaust gases within a melting furnace during an iron and steel manufacturing process, *excluding specific contaminants in the initial stage,"* as does the claimed invention.

In view of the above, amended independent claims 1 and 6 are patentable over Weinwurm. Dependent claims 2-3 and 7-8, directly or indirectly dependent on claims 1 and 6, are also patentable over Weinwurm for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 9 and 10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Publication No. JP 07-102302 ("Hiroshi"). As discussed above, by way of this reply, independent claim 9 has been amended to clarify the claimed invention. Thus, to the extent that this rejection may still apply to the amended claims, this rejection is respectfully traversed. As clarified by way of the amendments in this reply, the claimed invention is directed to "*a manufacturing apparatus for a solid iron product that contains neither organic nor oxide binder*," and requires "*wherein the apparatus forms the solid iron product with adding neither the organic nor oxide binder.*"

In contrast, Hiroshi merely disclsoes a method for preparing molded green compacts from magnetic powder using a rubber mold (*See*, for example, Abstract of Hiroshi). However, Hiroshi fails to show or suggest any feature of a manufacturing apparatus "*for a solid iron product that contains neither organic nor oxide binder*" and "*wherein the apparatus forms the solid iron product with adding neither the organic nor oxide binder"* as required by the claimed invention. Nowhere does Hiroshi show or suggest the reuse of dusts as *a solid iron product that contains neither organic nor oxide binder*, as recited in the claim. In fact, Hiroshi teaches usage of a binder for forming the mold green and does not show or suggest any specific contents thereof.

In view of the above, amended independent claim 9 is patentable over Hiroshi because Hiroshi fails to show or suggest all of the limitations recited in the claim. Dependent claim 10 is

also patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

**Rejection(s) under 35 U.S.C. §103**

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Anderson. As discussed above, independent claim 1, as amended, is patentable over Anderson. By virtue of its dependence, claim 5 is patentable over Anderson for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

**Conclusion**

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 17214/013001).

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Respectfully submitted,

By _____

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